

WHAT IS CLAIMED IS:

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1. An image processing apparatus comprising:
  - input means for inputting image data of an original image;
  - 5 discriminating means for extracting a predetermined region by using a feature of pixel of the image data input from the input means, and for discriminating an attribute of the region;
  - determining means for determining the type of the image data on the basis of the distribution of the regions attribute of which discriminated by the discriminating means; and
  - 10 processing means for processing the image data as specified depending on the type of the image data determined by the determining means.
2. An image processing apparatus according to claim 1, wherein the determining means includes:
  - means for determining the type of the image data as at least one type selected from the group consisting of image data of uniform background, image data of dot background in the entire screen, image data of dot photo only, image data of continuous gradation photo only, image data of which region can be discriminated by rectangle, and image data of which region cannot be
  - 20 discriminated by rectangle.
3. An image processing apparatus according to claim 1, wherein the processing means includes:

means for converting at least one of resolution, compression rate, and number of colors of the image data, depending on the type determined by the determining means.

- 5 <sup>50</sup><sub>A27</sub> 4. An image processing apparatus according to claim 1, wherein the processing means includes:

10 correcting means for correcting the image data by performing at least one of density conversion and filter processing, depending on the type determined by the determining means.

5. An image processing apparatus according to claim 1, wherein the processing means includes:

15 changing means for changing the image format of the image data, depending on the type determined by the determining means.

6. An image processing apparatus according to claim 1, wherein the processing means includes:

20 processing means for selecting an application of image processing, depending on the type determined by the determining means, setting a parameter, and starting this application to perform image processing of the image data.

7. An image processing apparatus according to claim 1, wherein the processing means includes:

25 means for performing specified processing on the basis of the attribute of the region discriminated by the discriminating means, on the image data in every

region, when the determining result by the determining means is a specified result.

8. An image processing apparatus according to claim 1, wherein the processing means includes:

5       second discriminating means for discriminating the image type of the image data received from the input means in pixel unit, when the determining result by the determining means is a specified result; and

10       second processing means for processing the image data as specified, on the basis of the result discriminated by the second discriminating means.

9. An image processing apparatus according to claim 1, wherein the processing means includes:

15       setting means for setting for pixel unit discriminating process on the basis of the determining result by the determining means;

20       second discriminating means for discriminating the image type of the image data received from the input means in pixel unit on the basis of the setting by the setting means, when the determining result by the determining means is a specified result; and

25       second processing means for processing the image data as specified, on the basis of the result discriminated by the second discriminating means.

10. An image processing apparatus according to claim 1, wherein the processing means includes:

      second discriminating means for discriminating the

image type of the image data received from the input means in pixel unit, when the determining means determines that it takes more than a specified time for determining; and

5           second processing means for processing the image data as specified, on the basis of the result discriminated by the second discriminating means.

11. An image processing apparatus according to claim 1, wherein the processing means includes:

10           second discriminating means for determining the discrimination precision of the discriminating means, and when this discrimination precision is below a specific value, discriminating the image type of the image data received from the input means in pixel unit;  
15           and

          second processing means for processing the image data as specified, on the basis of the result discriminated by the second discriminating means.

20           12. An image processing apparatus according to claim 1, wherein the processing means includes:

          second discriminating means for determining the complicatedness of the discriminating means, and when this complicatedness is above a specific value, discriminating the image type of the image data  
25           received from the input means in pixel unit; and

          second processing means for processing the image data as specified, on the basis of the result

discriminated by the second discriminating means.

13. An image processing apparatus according to claim 1, further comprising:

5 storing means for receiving the image data from the input means, performing a first process on the image data parallel to the determining process of the determining means to obtain a first result, further performing a second process different from the first process to obtain a second result, and storing them in  
10 a memory region; and

means for reading out and outputting either one of the first result and second result from the storing means on the basis of the determining result of the determining means.

15 14. An image processing apparatus according to claim 1, wherein the discriminating means and judging means include:

20 means for discriminating the structure of the background from the extracted region, and judging the type of the image data on the basis thereof.

15. An image processing apparatus according to claim 1, wherein the judging means includes:

25 means for judging presence or absence of character from the distribution of attribute in each region discriminated by the discriminating means, and judging the type of the image data on the basis thereof.

16. An image processing apparatus according to

claim 1, wherein the judging means and processing means include:

judging means for judging the rectangle information and the type of the image data on the basis of the distribution of the attribute in each region discriminated by the discriminating means; and

processing means for processing the data as specified on the basis of the rectangle information and the type of the image data judged by the judging means.

17. An image processing apparatus according to claim 1, wherein the determining means includes:

means for discriminating the page information which is the image type of each page of the original image of the image data when the discriminating means cannot divide the image data into a plurality of rectangular regions, and determining the type of the image data on the basis thereof.

18. An image processing apparatus according to claim 1, wherein the determining means includes:

means for discriminating the page information which is the image type of each page of the original image of the image data when the region extracted by the discriminating means has a complicatedness more than a specific value, and determining the type of the image data on the basis thereof.

19. An image processing apparatus according to claim 1, wherein the judging means includes:

judging means for judging the type of the image data, regardless of the content of the original mode given from the user, on the basis of the distribution of the attribute of each region discriminated by the discriminating means.

20. An image processing apparatus according to claim 1, wherein the processing means includes:

second discriminating means for discriminating the image information of the image data received from the input means in the pixel unit according to the judging result when the judging result by the judging means is the specified result; and

second processing means for processing the image data as specified on the basis of the discrimination result discriminated by the second discriminating means.

21. An image forming apparatus comprising:

input means for inputting image data of an original image;

discriminating means for extracting a predetermined region by using a feature of pixel of the image data input from the input means, and for discriminating an attribute of the region;

determining means for determining the type of the image data on the basis of the distribution of the regions attribute of which discriminated by the discriminating means;

processing means for processing the image data as

specified depending on the type of the image data determined by the determining means; and

image forming means for forming an image on a recording medium on the basis of the image data

5 processed as specified by the processing means.

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22. An image processing method comprising:

input step of inputting image data of an original image;

10 discriminating step of extracting a predetermined region by using a feature of pixel of the image data input at the input step, and for discriminating an attribute of the region;

15 determining step of determining the type of the image data on the basis of the distribution of the attributes of the regions discriminated at the discriminating step; and

processing step of processing the image data as specified depending on the type of the image data determined at the determining step.

20 23. An image processing method according to claim 22, wherein the determining step includes:

25 step of determining the type of the image data as at least one type selected from the group consisting of image data of uniform background, image data of dot background in the entire screen, image data of dot photo only, image data of continuous gradation photo only, image data of which region can be discriminated



by rectangle, and image data of which region cannot be discriminated by rectangle.

24. An image processing method according to claim 22, wherein the processing step includes:

5        step of converting at least one of resolution, compression rate, and number of colors of the image data, depending on the type determined at the determining step.

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24 7 25. An image processing method according to claim 22, wherein the processing step includes:

10        correcting step of correcting the image data by performing at least one of density conversion and filter processing, depending on the type determined at the determining step.

15        26. An image processing method according to claim 22, wherein the processing step includes:

      changing step of changing the image format of the image data, depending on the type determined at the determining step.

20        27. An image processing method according to claim 22, wherein the processing step includes:

      processing step of selecting an application of image processing, depending on the type determined at the determining step, setting a parameter, and starting  
25        this application to perform image processing of the image data.

28. An image processing method according to

claim 22, wherein the processing step includes:

step of performing specified processing on the basis of the attribute of the region discriminated at the discriminating step, on the image data in every region, when the determining result at the determining step is a specified result.

29. An image processing method according to claim 22, wherein the processing step includes:

second discriminating step of discriminating the image type of the image data received from the input step in pixel unit, when the determining result at the determining step is a specified result; and

second processing step of processing the image data as specified, on the basis of the result discriminated at the second discriminating step.

30. An image processing method according to claim 22, wherein the processing step includes:

setting step of setting for pixel unit discriminating process on the basis of the determining result at the determining step;

second discriminating step of discriminating the image type of the image data received from the input step in pixel unit on the basis of the setting at the setting step, when the determining result at the determining step is a specified result; and

second processing step of processing the image data as specified, on the basis of the result

discriminated at the second discriminating step.

31. An image processing method according to claim 22, wherein the processing step includes:

5 second discriminating step of discriminating the image type of the image data received from the input step in pixel unit, when it is determined that it takes more than a specified time for determining at the determining step; and

10 second processing step of processing the image data as specified, on the basis of the result discriminated at the second discriminating step.

32. An image processing method according to claim 22, wherein the processing step includes:

15 second discriminating step of determining the discrimination precision at the discriminating step, and when this discrimination precision is below a specific value, discriminating the image type of the image data received from the input step in pixel unit; and

20 second processing step of processing the image data as specified, on the basis of the result discriminated at the second discriminating step.

33. An image processing method according to claim 22, wherein the processing step includes:

25 second discriminating step of determining the complicatedness at the discriminating step, and when this complicatedness is above a specific value,

discriminating the image type of the image data received from the input step in pixel unit; and

second processing step of processing the image data as specified, on the basis of the result discriminated at the second discriminating step.

34. An image processing method according to claim 22, further comprising:

storing step of receiving the image data from the input step, performing a first process on the image data parallel to the determining process at the determining step to obtain a first result, further performing a second process different from the first process to obtain a second result, and storing them in a memory region; and

step of reading out and outputting either one of the first result and second result stored at the storing step on the basis of the determining result at the determining step.

35. An image processing method according to claim 22, wherein the discriminating step and judging step include:

step of discriminating the structure of the background from the extracted region, and judging the type of the image data on the basis thereof.

36. An image processing method according to claim 22, wherein the judging step includes:

step of judging presence or absence of character

from the distribution of attribute in each region discriminated at the discriminating step, and judging the type of the image data on the basis thereof.

37. An image processing method according to  
5 claim 22, wherein the judging step and processing step include the steps of:

judging the rectangle information and the type of  
the image data on the basis of the distribution of the  
attribute in each region discriminated at the  
10 discriminating step; and

processing the data as specified on the basis of  
the rectangle information and the type of the image  
data judged at the judging step.

38. An image processing method according to  
15 claim 22, wherein the determining step includes:

step of discriminating the page information which  
is the image type of each page of the original image of  
the image data when the discriminating step cannot  
divide the image data into a plurality of rectangular  
20 regions, and determining the type of the image data on  
the basis thereof.

39. An image processing method according to  
claim 22, wherein the determining step includes:

step of discriminating the page information which  
25 is the image type of each page of the original image of  
the image data when the region extracted at the  
discriminating step has a complicatedness more than a

specific value, and determining the type of the image data on the basis thereof.

40. An image processing method according to claim 22, wherein the judging step includes a judging  
5 step of judging the type of the image data, regardless of the content of the original mode given from the user, on the basis of the distribution of the attribute of each region discriminated at the discriminating step.

41. An image processing method according to  
10 claim 22, wherein the processing step includes:

second discriminating step of discriminating the image information of the image data received from the input means in the pixel unit according to the judging result when the judging result at the judging step is  
15 the specified result; and

second processing step of processing the image data as specified on the basis of the discrimination result discriminated at the second discriminating step.

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